

## C L A I M S

1. Method for producing alloy wheels for motor vehicles, each wheel (1) comprising a hub (3) and a rim (5); the method including realising a finishing operation with a cutting machine tool; the method being characterised by comprising the steps of measuring the unbalance of said wheel (1), and checking whether said unbalance is lower than an unbalance acceptability value ( $M_{\max}$ ;  $M_{1\max}$ ;  $M_{2\max}$ ) by means of a control unit (35).  
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2. Method according to claim 1, characterised by calculating a mass ( $M$ ;  $M_1$ ;  $M_2$ ) to be removed and the respective phase ( $F$ ;  $F_1$ ;  $F_2$ ) with respect to a determined point on the wheel (1); said unbalance being identified by said mass ( $M$ ;  $M_1$ ;  $M_2$ ) and by said phase ( $F$ ;  $F_1$ ;  $F_2$ ).  
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3. Method according to claim 1 or 2, characterised by calculating a simulated mass ( $MS$ ;  $MS_1$ ;  $MS_2$ ) to be removed from said wheel (1) to correct the unbalance of the wheel (1) in working condition and the respective simulated phase ( $FS$ ;  $FS_1$ ;  $FS_2$ ).  
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- 25 4. Method according to claim 3, characterised by comparing the said simulated mass ( $MS$ ;  $MS_1$ ;  $MS_2$ ) with the unbalance acceptability value ( $M_{\max}$ ;  $M_{1\max}$ ;  $M_{2\max}$ ).

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5. Method according to claim 4, characterised by giving an unbalance acceptance signal (A) when the simulated mass (MS; MS1; MS2) is lower than the unbalance acceptability value ( $M_{max}$ ;  $M_{1max}$ ;  $M_{2max}$ ).

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6. Method according to claim 3, characterised by removing the simulated mass (MS; MS1; MS2) from the wheel (1) to compensate the unbalance when the unbalance is not acceptable.

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7. Method according to one of the claims from 3 to 6, characterised by removing the simulated mass (MS; MS1; MS2) from the wheel (1) with a cutting machine tool.

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8. Method according to claim 7, characterised in that the finishing machining process, the checking of unbalance and the possible removal of the simulated mass (MS; MS1; MS2) are carried out on a single cutting machine tool (24).

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9. Method according to one of the claims from 3 to 8, characterised by calculating the simulated mass (MS; MS1; MS2) according to the mass (M; M1; M2) and the phase (F; F1; F2) and the mass of a valve (MV) and the 25 phase of the valve (FV).

10. Method according to any one of the claims from 3 to

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8, characterised by calculating the geometry (G; G1; G2) of the simulated mass (MS; MS1; MS2) according to the geometry (GR) of the wheel (1) and the specific weight (PR) of the wheel (1).

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11. Method according to claim 10, characterised by calculating the geometry (G; G1; G2) of said simulated mass (MS; MS1; MS2) according to the type of machining (LT) selected.

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12. Method according to claim 11, characterised by determining the coordinates (C; C1; C2) of the said geometry (G; G1; G2) with respect to a point of reference on the wheel (1).

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13. Method according to claim 12, characterised by transferring the coordinates (C; C1; C2) to a numerical control (38) of the cutting machine tool (24).

20 14. Method according to one of the claims from 2 to 13, characterised by calculating a first mass and a second mass (M1, M2) to be removed and the respective first and second phase (F1, F2), separate from each other along the axle (2) of the wheel (1), calculates a first and a  
25 second simulated mass (MS1, MS2) and the respective first and second phase (FS1, FS2) in working conditions of the wheel (1), and removes the first simulated mass

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(MS1) when the first simulated mass (MS1) is not lower than a first unbalance acceptability value ( $M_{1\max}$ ) and removes the second simulated mass (MS2) when the second simulated mass (MS2) is not lower than a second unbalance acceptability value ( $M_{2\max}$ ).  
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15. System for producing alloy wheels for motor vehicles, each wheel (1) comprising a hub (3) and a rim (5); the system comprising a cutting machine tool for  
10 carrying out finishing operation; the system being characterised by comprising means for detecting (14; 40) the unbalance of said wheel (1) and means for checking (19; 46; 50; 51) whether said unbalance falls within an unbalance acceptability value ( $M_{\max}$ ;  $M_{1\max}$ ;  $M_{2\max}$ ).

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16. System according to claim 15, characterised by comprising means for calculating (15; 41; 42) a mass (M;  $M_1$ ;  $M_2$ ) to be removed which causes the unbalance and the respective phase (F;  $F_1$ ;  $F_2$ ) with respect to a  
20 determined point on the wheel (1).

17. System according to claim 15 or 16, characterised by comprising means for calculating (17; 44) a simulated mass (MS; MS1; MS2) to be removed from the wheel (1) to  
25 correct the unbalance of the wheel (1) in working condition and the respective simulated phase (FS;  $FS_1$ ;  $FS_2$ ).

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18. System according to claim 17, characterised by comprising means for checking (19; 46; 50; 51) the simulated mass (MS; MS1; MS2) of the unbalance acceptability with respect to an unbalance acceptability 5 value ( $M_{max}$ ;  $M_{1max}$ ;  $M_{2max}$ ).

19. System according to claim 18, characterised by comprising means (20; 55) for giving a signal of acceptability (A) of the unbalance in the case where the 10 simulated mass (MS; MS1; MS2) is lower than the unbalance acceptability value ( $M_{max}$ ;  $M_{1max}$ ;  $M_{2max}$ ).

20. System according to one of the claims from 15 to 19, characterised by comprising a cutting machine tool for 15 removing said simulated mass (MS; MS1; MS2) from the said wheel (1) to compensate the unbalance, when the mass (MS; MS1; MS2) is not lower than the unbalance acceptability value ( $M_{max}$ ;  $M_{1max}$ ;  $M_{2max}$ ).

20 21. System according to claim 20, characterised by comprising a cutting machine tool (24) comprising sensors (36, 37; 36, 37, 39) for detecting unbalance, a control unit (35) for calculating the simulated mass (MS; MS1; MS2) and the respective phase (FS; FS1; FS2) 25 and the coordinates (C; C1; C2) of said simulated mass (MS; MS1; MS2), and a numerical control (38) suited to acquire said coordinates; said cutting machine tool (24)

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being suited to carry out the machining finishing operation, to check the unbalance and eventually to remove the simulated mass (MS; MS1; MS2).